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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,526	03/29/2004	Kong Weng Lee	70030845-1	3297

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AVAGO TECHNOLOGIES, LTD.
P.O. BOX 1920
DENVER, CO 80201-1920

EXAMINER

MAKIYA, DAVID J

ART UNIT	PAPER NUMBER
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2885

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/812,526	Applicant(s) LEE ET AL.	
	Examiner David J. Makiya	Art Unit 2885	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,8-12,15-19 and 22-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,8-12,15-19 and 22-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>12/13/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-5, 8, 11-12, 15-19, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takekuma (US 2003/0067264) in view of Haitz (US Patent 3,780,357).

With respect to claim 1, Takekuma teaches a light emitting diode package comprising a one piece ceramic substrate and cup 30 for mounting a light emitting diode 50, the one piece ceramic substrate and cup formed from an opaque ceramic material (Paragraph 18) and defining a cavity with a ceramic sidewall (Figure 1), wherein the cavity is shaped to focus light in a predetermined direction (Figure 1), and a coating 31 on a portion of the ceramic substrate for reflecting light in a predetermined direction (Paragraph 21). However, Takekuma fails to teach the sidewalls of the cavity being vertical or the coating for reflecting light being metallic. Haitz teaches a light emitting diode package (Figure 4) with a ceramic substrate (16, 18; Column 4, Lines 58-60) for mounting a light emitting diode 12, the substrate defining a cavity with reflective, vertical sidewalls 21 shaped to focus light in a predetermined direction (Figures 3A and 4), where the reflecting surface is a metallic coating (Column 5, Lines 6-9). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Takekuma with the teachings of Haitz because a cavity with vertical sidewalls and a metallic, reflective

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coating would emit light “uniform in appearance” and “more intense” (Haitz; Column 5, Lines 37-43).

With respect to claim 4, Takekuma teaches the light emitting diode package wherein the cavity is substantially an oval shaped cavity (Figures 1 and 2).

With respect to claim 5, Takekuma teaches the light emitting diode package wherein the cavity is substantially a circular shaped cavity (Figures 1 and 2).

With respect to claim 8, Takekuma teaches a method for manufacture of a light emitting diode package comprising forming a one piece ceramic substrate and cup 30 for mounting a light emitting diode 50, the one piece ceramic substrate and cup formed from an opaque ceramic material (Paragraph 18) defining a cavity with a ceramic sidewall (Figure 1), and the cavity having a bottom and a top (Figure 1), wherein the cavity is shaped to focus light in a predetermined direction (Figure 1), coating a portion of the ceramic cavity with a light reflective material (31; Paragraph 22), positioning a light emitting diode 50 on the substrate, and depositing an optically transparent material (20, 70) in the cavity to protect the light emitting diode.

However, Takekuma fails to teach the sidewalls of the cavity being vertical. Haitz teaches a method for manufacture of a light emitting diode package (Figure 4) with a ceramic substrate (16, 18; Column 4, Lines 58-60) for mounting a light emitting diode 12, the substrate defining a cavity with reflective, vertical sidewalls 21 shaped to focus light in a predetermined direction (Figures 3A and 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Takekuma with the teachings of Haitz because a cavity with vertical sidewalls would be “uniform in appearance” and “more intense” (Haitz; Column 5, Lines 37-43).

With respect to claim 11, Takekuma teaches the light emitting diode package wherein the cavity is substantially oval shaped cavity (Figures 1 and 2).

With respect to claim 12, Takekuma teaches the light emitting diode package wherein the cavity is substantially circular shaped cavity (Figures 1 and 2).

With respect to claims 15-17, Takekuma teaches the method wherein positioning the light emitting diode comprises determining a location between the bottom and the top of the cavity to locate the light emitting diode (Figure 1). It is an inherent characteristic of a light-emitting device to have a viewing angle. Based on the structure of the reference light emitting diode package, positioning the light emitting diode within the cavity will result in light emitting only within an angle created by the cavity. It is therefore inherent in the structure of the device that positioning the light emitting diode within the cavity will achieve a predetermined viewing angle of the light emitting diode while moving the light emitting diode closer to the bottom of the cavity will reduce the viewing angle and moving it closer to the top of the cavity will increase the viewing angle.

With respect to claim 18, Takekuma teaches the method wherein depositing the optically transparent material 20 in the cavity to protect to light emitting diode comprises forming a domed layer 22 of the optically transparent material over the light emitting diode (Figure 1).

With respect to claim 19, Takekuma teaches the method wherein depositing the optically transparent material 70 in the cavity to protect to light emitting diode comprises forming a concaved layer 72 of the optically transparent material over the light emitting diode (Figure 1).

With respect to claim 25, Takekuma teaches a light emitting diode package comprising a ceramic one piece substrate and cup 30 package for mounting a light emitting diode 50, the

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ceramic one piece substrate and cup package defining a cavity (Figure 1); and wherein the ceramic one piece substrate cup and package is formed from an opaque ceramic material (Paragraph 18). However, Takekuma fails to teach the sidewalls of the cavity being vertical. Haitz teaches a method for manufacture of a light emitting diode package (Figure 4) with a ceramic substrate (16, 18; Column 4, Lines 58-60) for mounting a light emitting diode 12, the substrate defining a cavity with reflective, vertical sidewalls 21 shaped to focus light in a predetermined direction (Figures 3A and 4). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Takekuma with the teachings of Haitz because a cavity with vertical sidewalls would be “uniform in appearance” and “more intense” (Haitz; Column 5, Lines 37-43).

Claims 2-3 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takekuma in view of Haitz as applied to claims 1 and 8 above and further in view of Ishinaga (US Patent 6,355,946).

With respect to claims 2-3, Takekuma in view of Haitz teaches the light emitting diode package as described in claim 1, but fails to explicitly state the shape of the cavity to be rectangular or trapezoidal shaped. Ishinaga teaches the use of rectangular (Figure 8), trapezoidal (Figure 7), oval (Figure 2), and circular (Figure 12) shaped cavities. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Takekuma package with the teachings of Ishinaga because different shapes would provide different illumination patterns (Ishinaga; Figures 2, 7, 8, and 12).

With respect to claims 9-10, Takekuma in view of Haitz teaches the method for manufacture of a light emitting diode package as described in claim 8, but fails to explicitly state

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the shape of the cavity to be rectangular or trapezoidal shaped. Ishinaga teaches the use of rectangular (Figure 8), trapezoidal (Figure 7), oval (Figure 2), and circular (Figure 12) shaped cavities. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Takekuma method with the teachings of Ishinaga because different shapes would provide different illumination patterns (Ishinaga; Figures 2; 7, 8, and 12).

Claims 22, 24, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takekuma in view of Haitz as applied to claims 1 and 8 above, and further in view of Song et al. (US Patent 6,707,069).

With respect to claims 22 and 26, Takekuma in view of Haitz teaches the light emitting diode package as described above, but fails to teach the opaque ceramic material is an alumina or aluminum nitride based material. Song et al. teaches a light emitting diode package with a light emitting diode 105 mounted to a ceramic substrate and cup (101,102) with a vertical sidewall (Column 2, Lines 48-51) wherein the opaque ceramic material is an alumina or aluminum nitride based material (Column 5, Lines 50-62). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Takekuma in view of Haitz with the teachings of Song et al. because alumina based ceramics “have high heat conductivity and a high heat dissipation effect, thus effectively solving the problems of thermal degradation of LED packages and thermal stress of package bodies caused by heat radiated from LED chips” (Song et al.; Column 3, Lines 2-15).

With respect to claim 24, Takekuma in view of Haitz teaches the method of manufacture of a light emitting diode package as described above, but fails to teach the opaque ceramic material is an alumina or aluminum nitride based material. Song et al. teaches a method of

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manufacture of a light emitting diode package with a light emitting diode 105 mounted to a ceramic substrate and cup (101,102) with a vertical sidewall (Column 2, Lines 48-51) wherein the opaque ceramic material is an alumina or aluminum nitride based material (Column 5, Lines 50-62). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Takekuma in view of Haitz with the teachings of Song et al. because “have high heat conductivity and a high heat dissipation effect, thus effectively solving the problems of thermal degradation of LED packages and thermal stress of package bodies caused by heat radiated from LED chips” (Song et al.; Column 3, Lines 2-15).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takekuma in view of Haitz as applied to claim 8 above, and further in view of Shaddock (US 2002/0163001).

With respect to claim 23, Takekuma in view of Haitz teaches the method as described above, but fails to teach forming the substrate comprises using a die that can be stamped on the substrate. Shaddock teaches mounting a light emitting diode 20 in a one piece substrate and cup 116 and forming the substrate comprises using a die that can be stamped on a sheet of material to form the one piece substrate and cup (Paragraph 21). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Takekuma in view of Haitz with the teachings of Shaddock because stamping would “both cause the depression for the reflector cup and cut away windows to provide separation between the reflector cup and at least one lead” (Shaddock; Paragraph 17).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection

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is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 8, and 25 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 8 of copending Application No. 10/669986. Although the conflicting claims are not identical, they are not patentably distinct from each other because a housing would be similar to a cup and the light emitting diode would in the ceramic housing with vertical sidewalls.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

Applicant's arguments with respect to claims 1-5, 8-12, 15-19, and 22-26 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's arguments, the new Takekuma reference addresses the claim limitation of a one piece ceramic substrate and cup, and is therefore used in combination with the other references as detailed above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cao (US 2004/0256630) teaches a one piece ceramic substrate and cup for a light emitting diode. Matsumura et al. (US 2004/0240203) teaches an LED with an aluminum nitride ceramic substrate.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

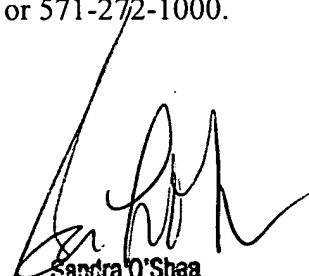
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Makiya whose telephone number is (571) 272-2273. The examiner can normally be reached on Monday-Friday 7:30am - 4:00pm (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DJM 03/19/2007



Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800